

WHAT IS CLAIMED IS:

1. A disk-shaped information recording medium which has a first recording layer on which information can be recorded/reproduced by a light beam coming from a predetermined surface, and a second recording layer on which information can be recorded/reproduced by a light beam coming from the same predetermined surface, and which is stacked on said first recording layer, comprising:

each of said first and second recording layers has a spiral track which defines a plurality of rounds, and

at least one index header aligned in a radial direction of the disk to partially intercept said spiral track,

said index header has address data of each round of said spiral track, which is formed by embossed pits, and

some or all of said index headers of said first and second recording layers are laid out to overlap each other when viewed from the predetermined surface.

2. A medium according to claim 1, wherein said spiral track has wobbles having a constant spatial frequency,

said spiral track has an area where a plurality of recording fields are recorded, and

each recording field has a header field where

address data is recorded, and a data field where target data is recorded.

3. A medium according to claim 1, wherein each of said first and second recording layers has a plurality of concentric zones,

each zone includes the spiral track having wobbles, and

the number of wobbles per round of the spiral track within a given zone is constant, and a disk rotational speed upon accessing a specific zone, and a frequency upon recording data on the specific zone, can be determined on the basis of a frequency reproduced from the wobbles of the spiral track.

4. A medium according to claim 2, wherein a specific one of said plurality of recording fields extends across said index header,

the specific recording field has first and second sub recording fields to have said index header as a boundary, and

each of said first and second sub recording fields has a connection field used to connect the two sub recording fields.

5. A medium according to claim 4, wherein said first sub recording field has a first header field and a first sub data field,

said first sub data field has said connection field,

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        said second sub data field has said connection
field,

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said first and second header fields record identical address data.

7. A medium according to claim 2, wherein each of said first and second recording layers has

a mirror field, and

8. A medium according to claim 7, wherein the dummy areas on another recording layer except for the deepest recording layer viewed from the predetermined surface have a transmittance and reflectance equal to said index header and said predetermined emboss field on that recording layer.

9. A medium according to claim 7, wherein the

dummy areas are formed by the spiral track or embossed pits, and the dummy areas formed by the embossed pits are write-once recording & rewrite recording inhibition areas.

5 10. A medium according to claim 7, wherein when
said second recording layer is a deeper layer than said
first recording layer when viewed from the
predetermined surface, the dummy areas on said first
recording layer are narrower than the dummy areas on
10 said second recording layer.

11. A medium according to claim 7, wherein the
dummy areas have a training pattern formed by embossed
pits.

12. A disk-shaped information recording medium
15 comprising:

a spiral track; and

at least one index header aligned in a radial
direction of the disk to partially intercept said
spiral track,

20 said index header having address data recorded as
an embossed pattern,

said spiral track having an area where a plurality
of recording fields each having a predetermined track
length are recorded,

25 each of said recording fields having a header
field and a data field,

said header field having address data,

said data field having an area for recording user data,

a specific one of said recording fields being recorded on said spiral track to extend across said index header,

the specific recording field having first and second sub recording fields to have said index header as a boundary,

said first sub recording field having a first header field,

said second sub recording field having a second header field,

said first and second header fields having identical address data, and

said recording fields being recorded or reproduced at a constant linear velocity.

13. A medium according to claim 12, wherein said data field of said recording field records data having one ECC block length.

14. A medium according to claim 12, wherein wobbles of a constant cycle start from one end of a track formed between the neighboring index headers, and a track area corresponding to wobbles less than one cycle at the other end of the track is used as an adjustment area.

15. A medium according to claim 12, wherein each of said recording fields is formed in units of sync

frames, and

one of said first and second sub recording fields of the specific recording field, which is less than one sync frame unit, is used as an adjustment field.

5 16. An information recording apparatus for recording data on a disk-shaped information recording medium which has a first recording layer on which information can be recorded/reproduced by a light beam coming from a predetermined surface, and a second
10 recording layer on which information can be recorded/reproduced by a light beam coming from the same predetermined surface, and which is stacked on said first recording layer, and

 in which each of said first and second recording
15 layers has

 a spiral track which defines a plurality of rounds, and

 at least one index header aligned in a radial direction of the disk to partially intercept said
20 spiral track, and

 said index header has address data of each round of said spiral track, which is formed by embossed pits, said apparatus comprising:

 recording means for irradiating said information
25 recording medium with a reproduction light beam from the predetermined surface side, reading address data of said index header reflected in reflected light of

the reproduction light beam, and recording data by irradiating a target spiral track with a recording light beam on the basis of the address data.

17. An apparatus according to claim 16, further
5 comprising recording field recording means for recording a plurality of recording fields each having a header field and a data field on said spiral track, recording address data in the header field, and recording target data in the data field.

10 18. An apparatus according to claim 17, wherein said recording field recording means records a specific recording field across said index header upon successively recording said recording fields on said spiral track,

15 the specific recording field has first and second sub recording fields to have said index header as a boundary,

each of said first and second sub recording fields has the header field and the data field, and

20 said recording field recording means records identical address data in the header fields of said first and second sub recording fields.

19. An apparatus according to claim 17, wherein each of said first and second recording layers has

25 a predetermined emboss field where data is recorded by embossed pits, and

a mirror field,

dummy areas are respectively arranged between said index header and said recording field, between said predetermined emboss field and said recording field, and between said mirror field and said recording field, and

said recording means records a training pattern on the dummy areas.

20. An information recording apparatus for recording information on a disk-shaped information recording medium, which comprises:

a spiral track having wobbles of a constant cycle; and

at least one index header aligned in a radial direction of the disk to partially intercept said spiral track, and

in which said index header has address data recorded as an embossed pattern,

said apparatus comprising:

recording field recording means for recording a plurality of recording fields each having a header field and a data field at a constant linear velocity on said spiral track on the basis of a signal obtained from the wobbles, recording a specific one of said recording fields on said spiral track across said index header, recording first and second sub recording fields in the specific recording field to have said index header as a boundary, and recording identical address

data in a first header field of said first sub recording field and a second header field of said second sub recording field.

21. An apparatus according to claim 20, wherein
5 said recording field recording means records data for one ECC block length in the data field.

22. An apparatus according to claim 20, wherein
wobbles of a constant cycle start from one end of
a track formed between the neighboring index headers,
10 and a track area corresponding to wobbles less than one cycle at the other end of the track is used as an adjustment area, and
specific information is recorded in the adjustment area.

23. An apparatus according to claim 20, wherein
15 each of said recording fields is formed in units of sync frames,

one of said first and second sub recording fields
of the specific recording field, which is less than one
20 sync frame unit, is used as an adjustment field, and
said recording field recording means records specific information in the adjustment area.

24. An information recording method for recording
data on a disk-shaped information recording medium
25 which has a first recording layer on which information can be recorded/reproduced by a light beam coming from a predetermined surface, and a second recording layer

on which information can be recorded/reproduced by a light beam coming from the same predetermined surface, and which is stacked on said first recording layer, and

5 in which each of said first and second recording layers has

a spiral track which defines a plurality of rounds, and

10 at least one index header aligned in a radial direction of the disk to partially intercept said spiral track, and

said index header has address data of each round of said spiral track, which is formed by embossed pits, said method comprising the step of:

15 irradiating said information recording medium with a reproduction light beam from the predetermined surface side, reading address data of said index header reflected in reflected light of the reproduction light beam, and recording data by irradiating a target spiral track with a recording light beam on the basis of the address data.

20 25. A method according to claim 24, further comprising the step of recording a plurality of recording fields each having a header field and a data field on said spiral track, recording address data in the header field, and recording target data in the data field.

26. A method according to claim 25, wherein

a specific recording field is recorded across said index header upon successively recording said recording fields on said spiral track,

the specific recording field has first and second sub recording fields to have said index header as a boundary,

each of said first and second sub recording fields has the header field and the data field, and

identical address data is recorded in the header fields of said first and second sub recording fields.

27. A method according to claim 25, wherein each of said first and second recording layers has

a predetermined emboss field where data is recorded by embossed pits, and

a mirror field,

dummy areas are respectively arranged between said index header and said recording field, between said predetermined emboss field and said recording field, and between said mirror field and said recording field, and

a training pattern is recorded on the dummy areas.

28. An information recording method for recording information on a disk-shaped information recording medium, which comprises:

a spiral track having wobbles of a constant cycle; and

at least one index header aligned in a radial

direction of the disk to partially intercept said spiral track, and

in which said index header has address data recorded as an embossed pattern,

5 said method comprising the step of:

 recording a plurality of recording fields each having a header field and a data field at a constant linear velocity on said spiral track on the basis of a signal obtained from the wobbles, recording a specific one of said recording fields on said spiral track across said index header, recording first and second sub recording fields in the specific recording field to have said index header as a boundary, and recording identical address data in a first header field of said first sub recording field and a second header field of said second sub recording field.

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29. A method according to claim 28, wherein data for one ECC block length is recorded in the data field.

30. A method according to claim 28, wherein wobbles of a constant cycle start from one end of a track formed between the neighboring index headers, and a track area corresponding to wobbles less than one cycle at the other end of the track is used as an adjustment area, and

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25 specific information is recorded in the adjustment area.

31. A method according to claim 28, wherein each

of said recording fields is formed in units of sync frames,

one of said first and second sub recording fields of the specific recording field, which is less than one sync frame unit, is used as an adjustment field, and specific information is recorded in the adjustment area.

32. An information reproduction apparatus for reproducing data recorded on a disk-shaped information recording medium which has a first recording layer on which information can be recorded/reproduced by a light beam coming from a predetermined surface, and a second recording layer on which information can be recorded/reproduced by a light beam coming from the same predetermined surface, and which is stacked on said first recording layer, and

in which each of said first and second recording layers has

a spiral track which defines a plurality of rounds, and

at least one index header aligned in a radial direction of the disk to partially intercept said spiral track, and

said index header has address data of each round of said spiral track, which is formed by embossed pits, said apparatus comprising:

reproduction means for irradiating said

information recording medium with a reproduction light beam from the predetermined surface side, reading address data of said index header reflected in reflected light of the reproduction light beam, and reproducing data by irradiating a target spiral track with a reproduction light beam on the basis of the address data.

33. An apparatus according to claim 32, wherein each of said first and second recording layers has a predetermined emboss field where data is recorded by embossed pits, and

a mirror field,

dummy areas are respectively arranged between said index header and said recording field, between said predetermined emboss field and said recording field, and between said mirror field and said recording field, and

said reproduction means reproduces a training pattern from the dummy areas.

34. An information reproduction apparatus for reproducing information from a disk-shaped information recording medium, which comprises:

a spiral track which has wobbles of a constant cycle, and on which a plurality of recording fields each having a predetermined track length are recorded; and

at least one index header aligned in a radial

direction of the disk to partially intercept said spiral track, and

in which said index header has address data recorded as an embossed pattern,

5 each of said recording fields has a header field and a data field,

said header field has address data,

said data field has an area for recording user data,

10 a specific one of said recording fields is recorded on said spiral track across said index header, the specific recording field has first and second sub recording fields to have said index header as a boundary,

15 said first sub recording field has a first header field,

said second sub recording field has a second header field, and

20 said first and second header fields have identical address data,

said apparatus comprising:

reproduction means for reproducing said recording fields at a constant linear velocity on the basis of a signal obtained from the wobbles.

25 35. An information reproduction method for reproducing data recorded on a disk-shaped information recording medium which has a first recording layer on

which information can be recorded/reproduced by a light beam coming from a predetermined surface, and a second recording layer on which information can be recorded/reproduced by a light beam coming from the same

5 predetermined surface, and which is stacked on said first recording layer, and

in which each of said first and second recording layers has

10 a spiral track which defines a plurality of rounds, and

at least one index header aligned in a radial direction of the disk to partially intercept said spiral track, and

15 said index header has address data of each round of said spiral track, which is formed by embossed pits, said method comprising the step of:

20 irradiating said information recording medium with a reproduction light beam from the predetermined surface side, reading address data of said index header reflected in reflected light of the reproduction light beam, and reproducing data by irradiating a target spiral track with a reproduction light beam on the basis of the address data.

25 36. A method according to claim 35, wherein each of said first and second recording layers has

a predetermined emboss field where data is recorded by embossed pits, and

a mirror field,

dummy areas are respectively arranged between said index header and said recording field, between said predetermined emboss field and said recording field, and between said mirror field and said recording field, and

a training pattern is reproduced from the dummy areas.

37. An information reproduction method for reproducing information from a disk-shaped information recording medium, which comprises:

a spiral track which has wobbles of a constant cycle, and on which a plurality of recording fields each having a predetermined track length are recorded; and

at least one index header aligned in a radial direction of the disk to partially intercept said spiral track, and

in which said index header has address data recorded as an embossed pattern,

each of said recording fields has a header field and a data field,

said header field has address data,

said data field has an area for recording user data,

a specific one of said recording fields is recorded on said spiral track across said index header,

the specific recording field has first and second sub recording fields to have said index header as a boundary,

5 said first sub recording field has a first header field,

 said second sub recording field has a second header field, and

 said first and second header fields have identical address data,

10 said method comprising the step of:

 reproducing said recording fields at a constant linear velocity on the basis of a signal obtained from the wobbles.

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